

WHAT IS CLAIMED IS:

1. A simulation program product for controlling a computer having a model data base,

5 said product storing a plurality of simulation models, which simulate the operation of a subject, and comprising:

condition inputting means for causing the computer to set an initial state of the subject to be simulated, a simulation condition and a selection condition of the simulation model;

10 model selecting means for causing the computer to select said simulation model on the basis of said set selection condition of the simulation model and to read out the selected simulation model from said model data base;

simulation calculating means for causing the computer to apply said set initial state of the subject and said set simulation condition to said read out simulation model and to calculate the simulation; and

20 result outputting means for causing the computer to output a result of said simulation calculation.

2. A simulation program product for controlling a computer having a model data base, said product storing a plurality of simulation models, which simulate the operation of a subject, and comprising:

25 condition inputting means for causing the computer to set an initial state of the subject to be simulated,

a simulation condition and a selection condition of the simulation model;

model selecting means for causing the computer to select said simulation model on the basis of at least  
5 one state of said subject state and said environment state and said set selection condition of the simulation model and to read out the selected simulation model from said model data base;

simulation calculating means for causing the  
10 computer to apply said set initial state of the subject and said set simulation condition to said read out simulation model to calculate the simulation as well as for causing the computer to input at least one state of said subject state and said environment state obtained  
15 from the calculation in said model selecting means; and

result outputting means for causing the computer to output a result of said simulation calculation.

3. A simulation program product according to claim 2, wherein said selection condition has changing  
20 information to change the selected simulation model and the changing information includes a content, said content is defined by accordance with a state of a subject and/or a state of an environment to be inputted from said simulation calculating means and a threshold  
25 value set in advance with respect to the state of said subject and/or said state of said environment, said content designates simulation models which are

different from each other with a border of said threshold value are designated.

4. A simulation program product according to claim 3, further comprising variable converting means  
5 for causing the computer to read out a variable value of a present simulation model from said simulation calculating means, when the selected simulated model is changed by the changing information to convert this variable value into a variable value of a simulation  
10 model newly selected by said model selecting means and to input the obtained variable value in said simulation calculating means.

5. A simulation program product according to claim 4, wherein said variable converting means  
15 includes means for carrying out the conversion of said variable value on the basis of a conversion rule, which describes a conversion relation of the variable values between the models, by using a state of a periphery and a state of an environment to be obtained from said  
20 simulation calculating means.

6. A simulation program product according to claim 1, wherein said selection condition includes designating a simulation model directly.

7. A simulation program product according to claim 1, wherein said selection condition includes  
25 dividing a space in which said subject operates into some segments and designating a simulation model for

each segment.

8. A simulation program product according to claim 1, wherein said selection condition includes designating a partial segment of said space in which the subject operates as well as designating a simulation model in the segment.

9. A simulation program product according to claim 1, wherein said selection condition includes dividing a simulation time into a plurality of times and designating a simulation model for each time.

10. A simulation program product according to claim 1, wherein said selection condition includes designating a partial time of the simulation time as well as designating a simulation model correspond to the simulation time.

11. A simulation program product according to claim 1, wherein said selection condition includes dividing a space in which said subject operates into a plurality of segments, dividing the simulation time into a plurality of times and designating a simulation model in association with a combination of each time and each segment.

12. A simulation program product according to claim 1, wherein said selection condition includes designating a partial time of the simulation time as well as designating a partial segment in said space in

which the subject operates and designating a simulation model in association with a combination of the times and the segments.

5        13. A simulation program product according to claim 1, wherein said selection condition includes dividing a space in which said subject operates into a plurality of segments and designating a simulation model in a segment in which said subject is located.

10       14. A simulation program product according to claim 1, wherein said selection condition includes designating said subject and designating a simulation model in association with an area in a predetermined range of which the approximate center is the subject.

15       15. A simulation program product according to claim 1, further comprising data calculating means for causing the computer to calculate used data of a simulation model after switching from used data of a simulation model before switching on the basis of a relation of the mutual used data in two simulation  
20       models of a subject to be switched upon said switching.

16. A simulation method utilizing a model data base in which a plurality of simulation models simulating the operation of the subject are stored, comprising:

25       inputting a condition to set an initial state of said subject, a simulation condition and a selection condition of the simulation model;

selecting said simulation model on the basis of  
said set selection condition of the simulation model  
and reading out the selected simulation model from said  
model data base;

5       applying said set initial state and said set  
simulation condition to said read out simulation model  
and calculating a simulation; and  
          outputting a calculation result by said simulation  
calculating step.

10       17. A simulation method utilizing a model data  
base in which a plurality of simulation models  
simulating the operation of the subject are stored,  
comprising:

          inputting a condition to set an initial state of  
15       said subject, a simulation condition and a selection  
condition of the simulation model;

          selecting said simulation model on the basis of at  
least one of said subject state and said environment  
state and said set selection condition of the  
20       simulation model and reading out the selected  
simulation model from said model data base;

          applying said set initial state and said set  
simulation condition to said read out simulation model  
and calculating a simulation as well as inputting at  
25       least one of said subject state and said environment  
state obtained from the calculation, in said model  
selecting means; and

outputting a result of said simulation  
calculating.

18. A simulation method according to claim 17,  
wherein said selection condition has changing  
5 information to change the selected simulation model and  
said changing information includes a content, said  
content is defined by accordance with a state of a  
subject and/or a state of an environment to be inputted  
from said simulation calculating step and a threshold  
10 value set in advance with respect to said state of said  
subject and/or said state of said environment, said  
content designates simulation models which are  
different from each other with a border of said  
threshold value are designated.

15 19. A simulation method according to claim 18,  
further comprising the step of reading out a variable  
value of a present simulation model from said  
simulation calculating step, when the selected  
simulated model is changed by the changing information,  
20 converting this variable value into a variable value of  
a simulation model newly selected by said model  
selecting step and inputting the obtained variable  
value in said simulation calculating step.

20. A simulation method according to claim 19,  
25 wherein said variable converting step includes a  
step for carrying out the conversion of said variable  
value on the basis of a conversion rule, which

describes a conversion relation of a variable value between the models, by using a state of a periphery and a state of an environment to be obtained from said simulation calculating step.

5           21. A simulation method according to claim 17, further comprising:

calculating a simulation for each simulation model with respect to a first simulation model with a certain degree of details and a second simulation model with a degree of details, which is lower than that of the  
10           first simulation model upon setting said selection condition;

as a result of calculation of said respective simulations, outputting error differential data of said  
15           both calculation results, used data of said respective simulation models and error differential data of said both used data; and

detecting the used data in which the error differential data is large when the error differential data is large as a result of said both calculations and  
20           setting a threshold value of the used data into a selection condition for said switching.

22. A simulation system for utilizing a model data base which stores a plurality of simulation models,  
25           which simulate the operation of a subject comprising:

a setting device which sets an initial state of said subject, a simulation condition and a selection



condition of said simulation model;

a model selector which selects a simulation model  
on the basis of the selection condition set by said  
setting device to read out the simulation model from  
said model data base;

a simulation calculator which calculates the  
simulation by using a simulation model read out from  
said model selector on the basis of said initial state  
and said simulation condition set by said setting  
device; and

an outputting device which outputs the calculation  
result by said simulation calculator.

23. A simulation system for utilizing a model data  
base which stores a plurality of simulation models,  
which simulate the operation of a subject comprising:

a setting device which sets an initial state of  
said subject, a simulation condition and a selection  
condition of said simulation model;

a model selector which selects said simulation  
model on the basis of at least one state of said  
subject state and said environment state and said set  
selection condition of the simulation model to read out  
the selected simulation model from said model data  
base;

a simulation calculator which applies said set  
initial state and said set simulation condition to said  
read out simulation model to calculate the simulation

as well as inputs at least one state of said subject state and said environment state to be obtained from the calculation; and

an outputting device which outputs the calculation result by said simulation calculator.

24. A simulation system according to claim 23, wherein said selection condition has changing information to change the selected simulation model and the changing information includes a content, said content is defined by accordance with a state of a subject and/or a state of an environment to be inputted from said simulation calculator and a threshold value set in advance with respect to said state of said subject and/or said state of said environment, said content designates simulation models which are different from each other with a border of said threshold value are designated.

25. A simulation system according to claim 24, further comprising a variable converter which reads out a variable value of a present simulation model from said simulation calculator, when the selected simulated model is changing by the changing information, converts this variable value into a variable value of a simulation model newly selected by said model selector and inputs the obtained variable value in said simulation calculator.

26. A simulation system according to claim 25,

wherein said variable converter includes means for carrying out the conversion of said variable value on the basis of a conversion rule, which describes a conversion relation of the variable values between the  
5 models, by using a state of a periphery and a state of an environment to be obtained from said simulation calculator.

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